AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1. (Previously Presented) A waveguide group branching filter comprising:
- a circular-to-square waveguide multistage transformer connected to an input port;
- a branch waveguide polarizer/branching filter connected to said circular-to-square waveguide multistage transformer;
- a first waveguide frequency filter connected to a branching end of said branch waveguide polarizer/branching filter;
 - a rectangular waveguide H-plane T-branch circuit;
- a rectangular waveguide multistage transformer operably connecting one end of said branch waveguide polarizer/branching filter to said rectangular waveguide H-plane T-branch circuit;
- a second waveguide frequency filter connected to said rectangular waveguide H-plane T-branch circuit; and
- a third waveguide frequency filter connected to said rectangular waveguide H-plane T-branch circuit;

wherein:

a first radio wave of a first frequency band which has the polarization plane perpendicular to a branch plane of said waveguide polarizer/branching

Atty. Docket: 1163-0381P

filter, a second radio wave of said first frequency band which has the

polarization plane parallel to the branch plane of said branch waveguide

polarizer/branching filter, and a third radio wave of a second frequency band

higher than said first frequency band which has the same polarization plane as

that of said first radio wave are incident to said input port; and

said first radio wave is cut off by said first and second waveguide

frequency filters and is emitted from said third waveguide frequency filter, said

second radio wave is cut off by said rectangular waveguide multistage

transformer and is emitted from said first waveguide frequency filter, and said

third radio wave is cut off by said first and third waveguide frequency filters

and is emitted from said second waveguide frequency filter.

2. (Previously Presented) The waveguide group branching filter

according to claim 1, wherein the branch waveguide polarizer/branching filter

is formed by a square waveguide and a single coupling hole formed for coupling

said first waveguide frequency filter through one side wall of the square

waveguide at the branching end of said branch waveguide polarizer/branching

filter.

3. (Original) The waveguide group branching filter according to claim 1,

characterized in that the branch waveguide polarizer/branching filter is formed

by a square waveguide and two coupling holes formed through one side wall of

Page 3 of 20

Atty. Docket: 1163-0381P

the square waveguide at the branching end of said branch waveguide

polarizer/branching filter.

4. (Previously Presented) The waveguide group branching filter

according to claim 1, wherein the branch waveguide polarizer/branching filter

is formed by a square waveguide, a single coupling hole formed for coupling

said first waveguide frequency filter through one side wall of the square

waveguide at the branching end of said branch waveguide polarizer/branching

filter and a thin metal sheet inserted in said square waveguide.

5. (Original) The waveguide group branching filter according claim 1,

characterized in that the branch waveguide polarizer/branching filter is formed

by a square waveguide, two coupling holes formed through one side wall of the

square waveguide at the branching end of said branch waveguide

polarizer/branching filter and a thin metal sheet inserted in said square

waveguide.

6. (Previously Presented) The waveguide group branching filter according

to claim 1, further comprising a circularly polarized wave generator connected

between the input port and the circular-to-square waveguide multistage

transformer and composed of a circular waveguide and a dielectric plate

inserted in the circular waveguide.

Reply to Office Action of March 24, 2004

Atty. Docket: 1163-0381P

7. (Previously Presented) The waveguide group branching filter

according to claim 1, further comprising a circularly polarized wave generator

connected between the input port and the circular-to-square waveguide

multistage transformer and composed of a circular waveguide and a plurality of

metal pins mounted on the side wall of the circular waveguide.

8. (Previously Presented) The waveguide group branching filter according

to claim 1, further comprising a circularly polarized wave generator connected

between the input port and the circular-to-square waveguide multistage

transformer and composed of a circular waveguide and a plurality of grooves

cut in the side wall of the circular waveguide.

9. (Previously Presented) The waveguide group branching filter

according to claim 1, wherein the first, second and third waveguide frequency

filters are waveguide band-pass filters and wherein:

the first waveguide band-pass filter is formed by n rectangular cavity

resonators and n iris-type coupling holes;

the second waveguide band-pass filter is formed by m rectangular cavity

resonators and m+1 iris-type coupling holes; and

the third waveguide band-pass filter is formed by n rectangular cavity

resonators and n+1 iris-type coupling holes.

Atty. Docket: 1163-0381P

10. (Previously Presented) The waveguide group branching filter

according to claim 1, wherein the first, second and third waveguide frequency

filters are waveguide band-pass filters and wherein:

the second waveguide band-pass filter is formed by m rectangular cavity

resonators and 2m+2 post-type coupling holes; or

the third waveguide band-pass filter is formed by n rectangular cavity

resonators and 2n+2 post-type coupling holes.

11. (Previously Presented) The waveguide group branching filter

according to claim 1, wherein the first, second and third waveguide frequency

filters are waveguide band-pass filters and wherein:

the second waveguide band-pass filter is formed by m rectangular cavity

resonators and 3m+3 double-post-type coupling holes; or

the third waveguide band-pass filter is formed by n rectangular cavity

resonators and 3n+3 double-post-type coupling holes.

12. (Previously Presented) The waveguide group branching filter

according to claim 1, wherein:

at least one of the first and third waveguide frequency filters is a

waveguide low-pass filter formed by a corrugated or stepped rectangular

waveguide.

Reply to Office Action of March 24, 2004

Atty. Docket: 1163-0381P

13. (Previously Presented) The waveguide group branching filter

according to claim 1, wherein:

the second waveguide frequency filter is replaced with a waveguide

high-pass filter formed by a corrugated or stepped rectangular waveguide.

14. (Previously Presented) The waveguide group branching filter

according to claim 1, further comprising:

a rectangular waveguide E-plane T-branch circuit connected to the

branching end of the branch waveguide polarizer/branching filter and the first

waveguide band-pass filter; and

a fourth waveguide frequency filter connected to the rectangular

waveguide E-plane T-branch circuit,

wherein:

a fourth radio wave of the second frequency band which has the same

polarization plane as that of the second radio wave is incident to the input port,

the fourth radio wave being cut off by said branch waveguide

polarizer/branching filter and first waveguide frequency filter and being

emitted from said fourth waveguide frequency filter.

15. (Previously Presented) The waveguide group branching filter

according to claim 14, wherein:

the first and third waveguide frequency filters are waveguide band-pass

filters each formed by n rectangular cavity resonators and n+1 iris-type

coupling holes; and

the second and fourth waveguide frequency filters are waveguide band-

pass filters each formed by m rectangular cavity resonators and m+1 iris-type

coupling holes.

16. (Previously Presented) The waveguide group branching filter

according to claim 14, wherein the fourth waveguide frequency filter is a

waveguide high-pass filter formed by a corrugated or stepped rectangular

waveguide.

17. (Currently Amended) A waveguide group branching filter comprising:

a bore within a solid metal block, the bore including portions of varying

shapes including,

a transforming portion configured to receive a plurality of radio

waves from an input port and transform the received radio waves from modes

compatible with circular waveguides to modes compatible with rectangular

waveguides;

a branching portion operably connected to the multistage

transforming portion; and

a plurality of waveguide filtering portions operably connected to the

branching portion,

wherein the branching portion is configured to route the transformed

radio waves to the waveguide filtering portions, the waveguide filtering portions

being configured to emit each of the transformed radio waves through a

corresponding one of a plurality of output ports.

18. (Previously Presented) The waveguide group branching filter

according to claim 17, wherein the bore further comprises:

a rectangular waveguide multistage transforming portion operably

connecting the branching portion to the waveguide filtering portions, the

rectangular waveguide multistage transforming portion being configured to

reflect transformed radio waves of a first polarization plane and accept radio

waves of a second polarization plane,

wherein the waveguide filtering portions include a first, second and third

waveguide filtering portions, the first waveguide filter being operable to filter a

predetermined radio wave and to emit the reflected radio waves through a first

output port, the second and third waveguide filters being configured to filter

predetermined radio waves and to emit selected ones of the accepted radio

waves through second and third output ports, respectively.

Page 9 of 20

Reply to Office Action of March 24, 2004

Atty. Docket: 1163-0381P

19. (Previously Presented) The waveguide group branching filter

according to claim 18, wherein the first, second and third waveguide filtering

portions are configured as waveguide band-pass filters.

20. (Previously Presented) The waveguide group branching filter

according to claim 19, wherein the first waveguide filtering portion includes n

 $(n \ge 1)$ rectangular cavity resonators and n iris-type coupling holes.

21. (Previously Presented) The waveguide group branching filter

according to claim 20, wherein

the second waveguide filtering portion includes m (m \geq 1) rectangular

cavity resonators and m+1 iris-type coupling holes; and

the third waveguide filtering portion includes n rectangular cavity

resonators and n+1 iris-type coupling holes.

22. (Previously Presented) The waveguide group branching filter

according to claim 19, wherein

the second waveguide filtering portion includes m (m \geq 1) rectangular

cavity resonators and 2m+2 post-type coupling holes; and

the third waveguide filtering portion includes n ($n \ge 1$) rectangular cavity

resonators and 2n+2 post-type coupling holes.

Atty. Docket: 1163-0381P

23. (Previously Presented) The waveguide group branching filter

according to claim 19, wherein

the second waveguide filtering portion includes m (m \geq 1) rectangular

cavity resonators and 3m+3 post-type coupling holes; and

the third waveguide filtering portion includes n (n \geq 1) rectangular cavity

resonators and 3n+3 post-type coupling holes.

24. (Previously Presented) The waveguide group branching filter

according to claim 19, wherein at least one of the waveguide filtering portions

is configured as a corrugated or stepped rectangular waveguide.

25. (Previously Presented) The waveguide group branching filter

according to claim 24, wherein the corrugated or stepped rectangular

waveguide is configured to operate as a lowpass filter.

26. (Previously Presented) The waveguide group branching filter

according to claim 24, wherein the corrugated or stepped rectangular

waveguide is configured to operate as a highpass filter.

27. (Previously Presented) The waveguide group branching filter

according to claim 24, wherein the second waveguide filtering portion is

Reply to Office Action of March 24, 2004

Atty. Docket: 1163-0381P

configured to operate as a lowpass filter, and the third waveguide filtering

portion is configured to operate as a highpass filter.

28. (Previously Presented) The waveguide group branching filter

according to claim 17, wherein the branching portion is a rectangular

waveguide, further comprising

a metal sheet disposed within the branching portion.

29. (Previously Presented) The waveguide group branching filter

according to claim 17, wherein the transforming portion includes,

a polarizing portion configured to polarize the received radio waves as

right- and left-handed polarized radio waves, the transforming portion being

configured to transform the polarized waves from modes compatible with

circular waveguides to modes compatible with rectangular waveguides.

30. (Previously Presented) The waveguide group branching filter

according to claim 29, wherein the polarizing portion is configured as a circular

waveguide in which a dielectric sheet is disposed.

31. (Previously Presented) The waveguide group branching filter

according to claim 29, wherein the polarizing portion is configured as a circular

waveguide and a plurality of metal pins mounted on a sidewall of the circular

waveguide.

32. (Previously Presented) The waveguide group branching filter

according to claim 29, wherein the polarizing portion is configured as a circular

waveguide whose sidewall includes a plurality of grooves.

33. (Previously Presented) A method of manufacturing a waveguide

group branching filter, comprising:

boring surfaces of each of two metal blocks,

wherein a circuit structure is formed by the two bored surfaces, when

the metal blocks are assembled together, the circuit structure being operable to

receive a plurality radio waves, transform the received radio waves from modes

compatible with circular waveguides into modes compatible with rectangular

waveguides, and filtering the transformed radio waves, and emitting each

filtered radio wave from a corresponding one of a plurality of output ports.

34. (Previously Presented) The method according to claim 33, wherein

the boring step includes:

boring portions of the surface of each metal block so that, when the

metal blocks are assembled together, the circuit structure includes:

a transforming portion configured to receive a plurality of radio

waves from an input port and transform the received radio waves from modes

compatible with circular waveguides to modes compatible with rectangular

waveguides;

a branching portion operably connected to the multistage portion;

and

a plurality of waveguide filtering portions operably connected to the

branching portion,

wherein the branching portion is configured to route the transformed

radio waves to the waveguide filtering portions, the waveguide filtering portions

being configured to filter predetermined radio waves and to emit each of the

transformed radio waves through a corresponding one of a plurality of output

ports.

35. (Previously Presented) The method according to claim 34, wherein

the boring step includes,

boring a portion of the surface of each metal block so that, when the

metal blocks are assembled together, the circuit structure further includes:

a rectangular waveguide multistage transforming portion operably

connecting the branching portion to the waveguide filtering portions, the

rectangular waveguide multistage transforming portion being configured to

reflect transformed radio waves of a first polarization plane and accept radio waves of a second polarization plane,

wherein the waveguide frequency filtering portions include a first, second and third waveguide frequency filtering portions, the first waveguide frequency filter being operable to filter a predetermined radio wave and to emit the reflected radio waves through a first output port, the second and third waveguide frequency filters being configured to filter predetermined radio waves and to emit selected ones of the accepted radio waves through second and third output ports, respectively.

36. (Previously Presented) The method according to claim 34, wherein the boring step includes,

boring a portion of the surface of each metal block so that, when the metal blocks are assembled together, the circuit structure further includes:

a polarizing portion configured to polarize the received radio waves as right- and left-handed polarized radio waves, the transforming portion being configured to transform the polarized waves from modes compatible with circular waveguides to modes compatible with rectangular waveguides.

37. (Previously Presented) A waveguide group branching filter manufactured according to the method of claim 34.

Reply to Office Action of March 24, 2004

Atty. Docket: 1163-0381P

AMENDMENTS TO THE DRAWINGS:

The attached sheet of drawings includes changes to Fig. 1. This sheet replaces the original sheet including Fig. 1. In Fig. 1, the label "Conventional Art" has been added.

Attachment:

Replacement Sheet

Annotated Sheet Showing Changes